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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,907	07/27/2006	Claude Lamblin	P1923US	3511

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DRINKER BIDDLE & REATH LLP
ATTN: PATENT DOCKET DEPT.
191 N. WACKER DRIVE, SUITE 3700
CHICAGO, IL 60606

EXAMINER	
BORSETTI, GREG	

ART UNIT	PAPER NUMBER
2626	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/587,907	LAMBLIN ET AL.	
	Examiner	Art Unit	
	GREG A. BORSETTI	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 August 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 July 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-32 are pending.

2. Claims 1-15, 18, 20, 22-31 have been amended.

3. Claim 32 is new.

Response to Arguments

4. Applicant's arguments, filed 8/12/2008, with respect to the rejection(s) of claim(s) 1-31 under 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of 35 USC 101.

Drawings

5. The drawings filed on 7/27/2006 are objected to by the examiner.

   a. Fig. 1a and 1b should be labeled as prior art

   b. Fig. 5 should have the variables used in the flow chart defined in a key.

   c. Fig. 6 reverse the letters for block 61, it should read MDCT for modified discrete cosine transform.

   Correction is required.

Claim Objections

6. Claim 27 is objected to because of the following informalities: The asterisks used in claim 27 are not needed, an indentation will suffice.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 4, 6, 8-11, 13-15, 20, 22-27, and 30-32 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claims have been amended as to include "editing operations" which are not defined in the specification as to reasonably convey the metes and bounds of the newly added subject matter. Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. Claims 1-32 of the claimed invention are directed to non-statutory subject matter. Claims 4-29,32 are directed to a method for forming a dictionary calculating codevectors of various dimensionality/resolution, which does not fall into one of the enumerated four categories of patent eligible subject matter recited in 35 U.S.C. 101 (process, machine,

manufacture, or composition of matter). Claims 4-29,32 are not directed toward: 1) a process (nothing is processed/transformed, the claim subject matter is toward calculations pertaining to codevectors and dimensionality); 2) a machine (there are no claim elements towards an appropriate apparatus, such as the elements of a computing device); 3) a manufacture (no claim elements pertain to an output product); 4) a composition of matter (claim elements are toward codevector calculation, and not a composition of matter). Furthermore, the claims are directed to a method which forms a dictionary, and as claimed, is a mathematical calculation (algorithm) where the claims do not produce a useful, tangible, and concrete result. If the acts of a claimed process manipulate only numbers, abstract concepts or ideas, or signals representing any of the foregoing, the acts are not being applied to appropriate subject matter (Benson, 409 U.S. at 71-72, 175, USPQ at 676). Furthermore, claims define nonstatutory processes if they simply manipulate abstract ideas (Warmerdam, 33 F.3d at 1360,31 USPQ2d at 1759). As for guidance to areas of statutory subject matter, see 35 U.S.C. 101 Interim Guidelines (with emphasis of the Clarification of Interim Guidelines For Examination of Patent Applications for Subject Matter Eligibility); as an example, in Alappat, the claimed output smooth waveform (consisted of lighting pixels on an oscilloscope/display) is a useful, concrete, tangible, final result; in Arrhythmia, the claimed useful, concrete, tangible, final result represented the condition of a patient's heart; in State Street, the claimed useful, concrete, tangible, final result was data output that represented a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades. Claims 1-3, 30, 31

are also non-statutory under the most recent interpretation of the Interim Guidelines regarding 35 U.S.C.101 because although this claim is toward a computer readable medium, as claimed, does not define any structural and functional interrelationship between the computer program and other claimed elements of a computer which permit the computer program's functionality to be realized (Warmerdam, 33 F.3d at 1361,31 USPQ2d at 1760; Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035). Examiner notes that as per claims 1-3, elements such as "computer readable medium", and "a device" are necessary structures, the interrelationships between the computer readable medium, the device, and the dictionary are not positively claimed (e.g., "intended to be used" does not clearly define the relationship between the computer readable medium and the device, as well as how is the dictionary 'connected' to these devices -- i.e., a step of "storing" the dictionary is required, rather than 'having', as well as a step of the device accessing the computer readable medium). Claims 30, 31 are rejected under similar rationale as presented against claims 1-3 above, with the additional note that the "computer program product" has been clearly defined as a computer program in the specification, and in the current claim scope, is not considered to be a "signal".

Appropriate correction is required.

Allowable Subject Matter

9. Claims 4, 6, 8-11, 13-15, 20, 22-27, and 30-32 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 1st paragraph, set forth in this Office action.

10. Furthermore, claims 1-32 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 101, set forth in this Office action.

11. The following is an examiner's statement of reasons for allowance:

As per claim 1, the closest prior art, Gersho (#5890110), Chan ("Constrained-Storage Vector Quantization in High Fidelity Audio Transform Coding"), Singh ("Multidimensional Quantizers for Scalable Video Compression") fail to teach along or in reasonable combination the limitations:

A computer readable medium having a dictionary comprising codevectors of variable dimension stored thereon, said dictionary being intended to be used in a device for at least one of compression coding and decoding of digital signals, by vector quantization at variable rate defining a variable resolution, wherein the dictionary comprises:

- on inter-embedded sub-dictionaries of increasing resolution of a given dimension,

- wherein each sub-dictionary comprises a union:

• of a first set consisting of codevectors constructed by inserting, into codevectors of dictionaries of lower dimension, elements taken from a finite set of real numbers according to a finite collection of predetermined insertion rules,

• and of a second set consisting of codevectors that may not be obtained by insertion into codevectors of lower dimension of the elements of said finite set according to said collection of insertion rules.

Gersho is directed towards vector quantization of variable dimension, but fails to teach wherein the codebooks are embedded with increasing resolution for each dimension.

Chan is directed towards vector quantization and discloses that for variable rate encoding, embedded codebooks are used. However, Chan fails to teach variable dimension in combination with the embedded codebook.

Singh is directed to image coding which uses pyramid vector quantization (embedded resolution codebooks) for multidimensional quantization and scalability. However, Singh fails to teach the construction of the codevectors by insertion or deletion of elements by predetermined rules.

Claims 2-3 are allowable as they are dependent on and further limit claim 1.

As per claim 4, the closest prior art, Gersho (#5890110), Chan ("Constrained-Storage Vector Quantization in High Fidelity Audio Transform Coding"), Singh ("Multidimensional Quantizers for Scalable Video Compression") fail to teach along or in reasonable combination the limitations:

A method for forming a dictionary comprising codevectors of variable dimension and intended to be used in a device for compression coding and/or decoding of digital

signals, by vector quantization at variable rate defining a variable resolution, in which, for a given dimension:

a) a first set consisting of codevectors formed by performing an editing operation comprising at least one of inserting into and deleting from codevectors of dictionaries of dimension elements comprising at least one of lower and higher dimension elements taken from a finite set of real numbers according to a finite collection of predetermined editing operation rules,

b) a first, intermediate, dictionary comprising at least said first set is constructed, for said given dimension,

c) and, to adapt said dictionary to a use with at least one given resolution, a second, definitive, dictionary is constructed, on the basis of the intermediate dictionary, by performing at least one of embedding and simplification of dictionaries of at least one of increasing and decreasing resolutions, the dictionaries of increasing resolutions being inter-embedded from the dictionary of smallest resolution up to the dictionary of greatest resolution.

Gersho is directed towards vector quantization of variable dimension, and teaches the insertion of elements to increase dimensionality. However, Gersho fails to teach the resolution adaptation.

Chan is directed towards vector quantization and discloses that for variable rate encoding, embedded codebooks are used. However, Chan fails to teach the development of the codebook by insertion and deletion to obtain multiple resolutions across dimensions.

Singh is directed to image coding which uses pyramid vector quantization (embedded resolution codebooks) for multidimensional quantization and scalability. However, Singh fails to teach the construction of the codevectors by insertion or deletion of elements by predetermined rules.

Claims 5, 7-14, 18-20, 22-24, and 32 are allowable as they are dependent on and further limit claim 4.

Claim 30 is allowable as it applies the method of claim 4 to a computer readable memory.

Claims 6 and 15 are allowable as all the subject matter contained in claim 4 is present in claims 6 and 15, therefore claims 6 and 15 further limit the subject matter claimed in claim 4.

Claims 16-17, and 21 are allowable as they are dependent on and further limit claim 15.

As per claim 25, the closest prior art, Gersho (#5890110), Chan ("Constrained-Storage Vector Quantization in High Fidelity Audio Transform Coding"), Singh ("Multidimensional Quantizers for Scalable Video Compression") fail to teach along or in reasonable combination the limitations:

searching for a codevector (x^J) which is the nearest neighbour of an input vector $y=(y_0,\ldots, y_{k,\ldots}, y_{j-1})$ in a dictionary (D^i_j) of given dimension (j), said codevectors being reconstituted by using at least one correspondence table making it possible to

reconstitute any codevector of the dictionary of said given dimension, using indices of a collection of editing operation rules that are at least one of insertion and deletion rules and indices identifying elements of a set of codevectors that may not be obtained by application of the editing operation to codevectors of at least one of lower or € higher dimension than the given dimension according to said collection of editing operation insertion/deletion rules, and further comprising the following steps:

CO1) for a current index (m^j) of said codevector (x^j) sought, reconstitution at least partial of a codevector of index (m') corresponding to said current index (m^j), at least through the prior reading of the indices (j', m', l_r) appearing in the correspondence tables making it possible to formulate said dictionary,

CO2) at least on coding, calculation of a distance between the input vector and the codevector reconstituted in step CO 1),

CO3) at least on coding, repetition of steps CO1) and CO2), for all the current indices in said dictionary,

CO4) at least on coding, identification of the index (m_{min}) of the codevector at least partially reconstituted whose distance (d_{min}), calculated in the course of one of the iterations of step CO2), with the input vector is the smallest, and

CO5) at least on decoding, determination of the nearest neighbour of the input vector (y) in the guise of codevector (x^j) whose index (m_{min}) has been identified in step CO4).

Gersho is directed towards vector quantization of variable dimension, and teaches the use of a nearest neighbor algorithm to calculate the closest codevector to

an input vector. Gersho also teaches variable dimensionality. However, Gersho fails to teach that the codevectors reference a correspondence table to reconstitute any codevector in a wanted dimension by referencing insertions or deletion rules along with codevectors of at least one of lower or higher dimension than the given dimension.

Chan is directed towards vector quantization and discloses that for variable rate encoding, embedded codebooks are used. However, Chan teaches this for multi-resolution, not variable dimensionality.

Singh is directed to image coding which uses pyramid vector quantization (embedded resolution codebooks) for multidimensional quantization and scalability. However, Singh fails to teach the dimensional adaptation of the codevectors by referencing a correspondence table to reconstitute any codevector in a wanted dimension by referencing insertions or deletion rules along with codevectors of at least one of lower or higher dimension than the given dimension.

Claims 26-29 are allowable as they are dependent on and further limit claim 25.

Claim 31 is allowable as it applies the method of claim 25 to a computer readable memory.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Refer to PTO-892, Notice of References Cited for a listing of analogous art.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREG A. BORSETTI whose telephone number is (571)270-3885. The examiner can normally be reached on Monday - Thursday (8am - 5pm Eastern Time).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, RICHEMOND DORVIL can be reached on 571-272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Greg A. Borsetti/
Examiner, Art Unit 2626

/Michael N. Opsasnick/
Primary Examiner, Art Unit 2626